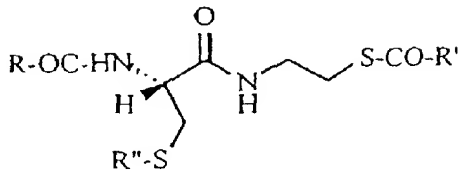
CLAIMS

1. A compound of general formula:



(I)

in which:

- R and R' independently represent a linear or branched C_1-C_7 alkyl radical or an aryl group which is unsubstituted or substituted by one or more radicals chosen from halogens, linear or branched C_1-C_3 alkyl radicals and -OH radicals;
- R" is hydrogen or a CO-R^1 group in which R^1 is a linear or branched C_1-C_7 alkyl radical or an aryl group which is unsubstituted or substituted by one or more radicals chosen from halogens, linear or branched C_1-C_3 alkyl radicals and -OH radicals;

and the dimers formed by a disulfide bridge from one and/or other of the two sulfur atoms of the compounds of general formula I composed of the R" radicals or of the R'CO- radicals of the two molecules, and the corresponding thiazolidine forms.

2. The compound as claimed in claim 1, characterized in that R is a methyl group (-CH_3).

3. The compound as claimed in claim 2, characterized in that R' is a methyl group (-CH_3).

4. The compound as claimed in claim 3, characterized in that R" is hydrogen (Compound N-(N-acetyl-L-cysteinyl)-S-acetylcysteamine).

5. The compound as claimed in claim 3, characterized in that R″ is an acetyl group (-$COCH_3$) (Compound N-(N,S-bisacetyl-L-cysteinyl)-S-acetylcysteamine).

6. The compound as claimed in claim 3, characterized in that R″ is an isobutyryl group (-$COCH(CH_3)_2$) (Compound N-(N-acetyl-S-isobutyryl-L-cysteinyl)-S-acetylcysteamine).

7. The compound as claimed in claim 3, characterized in that R″ is a pivaloyl group (-$COC(CH_3)_3$) (Compound N-(N-acetyl-S-pivaloyl-L-cysteinyl)-S-acetylcysteamine).

8. The compound as claimed in claim 2, characterized in that R′ is selected from the isopropyl group (-$CH(CH_3)_2$), the tert-butyl group (-$C(CH_3)_3$) and the phenyl group (-C_6H_5).

9. The compound as claimed in claim 8, characterized in that R″ is selected from hydrogen (-H), the acetyl group (-$COCH_3$), the isobutyryl group (-$COCH(CH_3)_2$), the pivaloyl group (-$COC(CH_3)_3$) or the benzoyl group (-CO-C_6H_5).

10. The compound as claimed in claim 1, characterized in that R is an isopropyl group (-$CH(CH_3)_2$).

11. The compound as claimed in claim 10, characterized in that R′ is selected from the methyl group (-CH_3), the isopropyl group (-$CH(CH_3)_2$), the tert-butyl group (-$C(CH_3)_3$) and the phenyl group (-C_6H_5).

12. The compound as claimed as claim 11, characterized in that R″ is selected from hydrogen (-H), the acetyl group (-$COCH_3$), the isobutyryl group (-$COCH(CH_3)_2$), the pivaloyl group (-$COC(CH_3)_3$) or

the benzoyl group ($-CO-C_6H_5$).

13. The compound as claimed in claim 8, characterized in that R″ is the trityl group.

14. The compound as claimed in claim 11, characterized in that R″ is the trityl group.

15. The compound as claimed in claim 1 to 14, characterized in that it is in the thiazolidine form.

16. A process for the preparation of the compound as claimed in any one of claims 1 to 14, characterized in that it comprises the following stages:
   a) protection of the N-acyl-L-cysteine to provide the N-acyl-S-trityl-L-cysteine compound; then
   b) coupling of the protected N-acyl-S-trityl-L-cysteine with the S-acylcysteamine hydrochloride to provide the N-(N-acyl-S-trityl-L-cysteinyl)-S-acylcysteamine compound.

17. A process for the preparation of the compound as claimed in claim 15, characterized in that it comprises the following stages:
   a) protection of the N-acyl-L-cysteine to provide the N-acyl-S-trityl-L-cysteine compound; then
   b) coupling of the protected N-acyl-S-trityl-L-cysteine with thiazolidine.

18. The process as claimed in claims 16 and 17 for the preparation of the compound as claimed in claims 1 to 12 and 15, characterized in that it additionally comprises the following stages:
   c) deprotection of said compound obtained in said stage b); then
   d) release of the free thiol of formula I.

19. The process as claimed in claims ~~1~~6 and 18 for the preparation of the compound as claimed in claim 4, characterized in that said N-acyl-S-trityl-L-cysteine compound of stage a) is the compound N-acetyl-S-trityl-L-cysteine and in that said S-acylcysteamine hydrochloride of stage b) is S-acetylcysteamine hydrochloride.

20. The process as claimed in claim 18 for the preparation of the compound as claimed in claims 1 to 3, 5 to 12 and 15, characterized in that it additionally comprises an S-acylation stage e).

21. A process for the preparation of the compound as claimed in claim 1 in which R = R' and R" is a hydrogen, characterized in that it comprises the following stages:

a) esterification of the carboxyl functional group of N-Boc-L-serine (1) with N-hydroxysuccinimide in N,N-dimethylformamide (DMF) in the presence of 1,3-dicyclohexylcarbodiimide (DCC) to form the active ester (1'); then,

b) *in situ* condensation of the active ester formed (1') with ethanolamine (2) to provide the compound N-(N-Boc-L-seryl)-2-aminoethanol (3); then,

c) Mitsunobu reaction on the compound (3) with triphenylphosphine and diisopropyl azodicarboxylate in the presence of thiocarboxylic acid in tetrahydrofuran to provide the compound N-(N-Boc-S-acyl-L-cysteinyl)-S-acylcysteamine (4); then,

d) deprotection of the compound (4) with trifluoroacetic acid.

22. The process as claimed in claim 21 for the preparation of the compound as claimed in claim 4, characterized in that said thiocarboxylic acid of stage c) is thioacetic acid.

23. A process for the preparation of the compound as claimed in claims 1 to 3 and 5 to 12 by S-acylation of the compound of claim 4 in solution in pyridine in the presence of an anhydride R_2O or of an acid chloride R-Cl, characterized in that R is chosen from the $CO-R^1$ group in which R^1 is a linear or branched C_1-C_7 alkyl radical or an aryl group which is unsubstituted or substituted by one or more halogen atoms.

24. A process for the preparation of the compound as claimed in claim 5 by S-acylation of the compound of claim 4 in solution in pyridine in the presence of acetic anhydride.

25. A process for the preparation of the compound as claimed in claim 6 by S-acylation of the compound of claim 4 in solution in pyridine in the presence of isobutyryl chloride.

26. A process for the preparation of the compound as claimed in claim 7 by S-acylation of the compound of claim 4 in solution in pyridine in the presence of pivaloyl chloride.

27. The precursor of a compound involved in the route for the biosynthesis of glutathione, characterized in that it is the compound as claimed in any one of claims 1 to 15.

28. The use of the compound as claimed in any one of claims 1 to 15 in the preparation of a product involved in the route for the biosynthesis of glutathione.

29. The use as claimed in claim 28, characterized in that said product is chosen from the group formed by N-acetyl-L-cysteine, cysteamine and L-cysteine.

30. The use of the compound as claimed in any one of claims 1 to 15 as antioxidizing agent.

31. The compound as claimed in one of claims 1 to 15 as medicament.

32. The compound as claimed in one of claims 1 to 15 as medicament intended to increase the intracellular and/or extracellular level of glutathione.

33. The use of the compound as claimed in any one of claims 1 to 15 in the preparation of medicament intended to increase the intracellular and/or extracellular level of glutathione.

34. A pharmaceutical composition, in particular a dermatological composition, characterized in that it comprises an effective amount of the compound as claimed in one of claims 1 to 15 and a pharmaceutically acceptable vehicle.

35. The use of the compound as claimed in one of claims 1 to 15 in the preparation of a medicament or of the pharmaceutical composition as claimed in claim 34 for the treatment and/or prevention of pathologies or disorders related to an intra- and/or extracellular depletion of glutathione.

36. The use as claimed in claim 35, characterized in that said pathologies are chosen from viral infections, bacterial infections, parasitic infections, diseases of the respiratory tract, neurodegenerative diseases, autoimmune diseases, cardiovascular diseases, cancers, diseases of the immune system, diabetes and preferably type I diabetes, ophthalmic pathologies or dermatological diseases.

37. The use as claimed in claim 36, characterized in that said pathologies are viral infections.

38. The use as claimed in claims 36 and 37, characterized in that said viral infections are infections caused by DNA viruses and RNA viruses, more particularly by retroid viruses, more particularly the human immunodeficiency virus (HIV) and preferably the type-1 human immunodeficiency virus (HIV-1).

39. The use as claimed in claims 36 to 38, characterized in that said compound is the compound as claimed in claim 4.

40. The use as claimed in claims 36 to 38, characterized in that said compound is the compound as claimed in one of claims 5 to 15.

41. A pharmaceutical composition for the preventive and curative treatment of AIDS and the associated affected tissues, characterized in that it comprises a therapeutically effective amount of the compound as claimed in claims 1 to 15 and a pharmaceutically acceptable vehicle.

42. A product comprising at least one compound as claimed in one of claims 1 to 15 and at least one reverse transcriptase inhibitor as combination product for a use in antiviral therapy which is simultaneous, separate or spaced out over time.

43. The product as claimed in claim 42, characterized in that said reverse transcriptase inhibitor is chosen, for example, from 3'-azido-3'-deoxythymidine (AZT), 2',3'-dideoxyinosine (ddI), 2',3'-dideoxycytidine (ddC), (-)-2',3'-dideoxy-3'-thiacytidine (3TC), 2',3'-didehydro-2',3'-dideoxy-

thymidine (d4T) and (-)-2'-deoxy-5-fluoro-3'-thiacytidine (FTC), TIBO, HEPT, TSAO, α-APA, nevirapine, BAHP or phosphonoformic acid (PFA).

44. The use as claimed in claim 35, characterized in that said pathologies are cardiovascular diseases preferably chosen from the group consisting of arterial hypertension, arteriosclerosis, cerebral ischemia, cardiac ischemia, ventricular arrhythmias, ventricular fibrillation and myocardial infarction.

45. The use as claimed in claim 35, characterized in that said pathologies are ophthalmic pathologies, in particular cataracts.

46. The use as claimed in claim 35, characterized in that said pathologies are diseases of the respiratory tract, in particular pulmonary emphysema, idiopathic pulmonary fibrosis, cystic fibrosis, chronic bronchitis, acute bronchitis or adult respiratory distress syndrome.

47. The use of the compound as claimed in any one of claims 1 to 15 in the preparation of a medicament or of the pharmaceutical composition as claimed in claim 34 intended for the preventive and/or curative treatment of noise-related hearing loss.

48. The use of the compound as claimed in any one of claims 1 to 15 in the preparation of a medicament or of the pharmaceutical composition as claimed in claim 34 intended for the treatment of poisoning related to the oral or parenteral administration, as or not as an overdose, of substances preferably chosen from the group consisting of acetaminophen, nitrites, ethanol, acrylonitrile and heavy metals, more particularly gold, silver and mercury.

49. The use as claimed in claim 30 of the compound as claimed in one of claims 1 to 15 in the field of cosmetics.

50. The use as claimed in claim 49 to:
(i) prevent, erase and treat wrinkles or fine lines of the skin; and/or
(ii) combat cutaneous and/or subcutaneous slackening; and/or
(iii) improve the texture of the skin and rekindle the radiance of the skin; and/or
(iv) remove undesired hairs from the skin; and/or
(v) decrease the sizes of the pores of the skin; and/or
(vi) permanently deform the hair.

51. A cosmetic composition for the treatment of the skin and/or hair and/or body hair, characterized in that it comprises the compound as claimed in one of claims 1 to 15 and a cosmetically acceptable excipient.

52. A process for the cosmetic treatment of the skin for preventing, erasing and treating wrinkles or fine lines of the skin and/or combating cutaneous and/or subcutaneous slackening and/or improving the texture of the skin and rekindling the radiance of the skin and/or removing undesired hairs from the skin and/or decreasing the sizes of the pores of the skin which comprises the application, to the skin, of the cosmetic composition as claimed in claim 51.

53. A process for the cosmetic treatment of the hair for the permanent deformation of the hair comprising the application, to the hair, of the cosmetic composition as claimed in claim 51.

54. The use as claimed in claim 30 in the farm-produce industry and in particular for the preservation of the organoleptic and nutritional properties of drinks, in particular fruit juices, and/or food.